
2. Benford

Program Name: Benford.java

Input File: benford.dat

Chris and Matthew are on the committee for a local scientific journal. In the past they've had a problem with accidentally publishing papers whose authors fabricated fraudulent experimental results. As a result, the journal is having serious funding issues and must come up with a way to detect these academically dishonest papers before publishing them.

Luckily for the company, Matt was recently browsing Wikipedia (that's what he does in his free time) and read about a frequency distribution law, called Benford's Law, that states that the digit 1 occurs as a leading digit about 30% of the time in most real life sources of data. Matt wants to write a program that will automatically analyze the distribution of leading digits in any random set of numbers.

Input

The first line of input contains a single integer, t , indicating the number of test cases to follow.

The first line of each test case consists of a single integer, n , indicating the number of lines in the test case to follow. The next n lines each consists of a single integer representing a data point in the test case.

Output

For each test case, print whether the numbers in the test case pass Benford's Law's distribution. A dataset is said to pass Benford's Law if the percentage of numbers that begin with a leading 1 digit is within $30 \pm 5\%$. If the dataset does not pass Benford's Law, print the percentage of numbers that began with a leading 1 digit, rounded to the nearest hundredth.

Constraints

$1 \leq t \leq 10$
 $1 \leq n \leq 10000$

Example Input File

```
2
4
10
5
9
2
3
17
100
49
```

Example Output to Screen

```
PASSED
FAILED: 66.67%
```

Explanation of sample cases

In the first case, only one of the four numbers begins with a leading 1 digit. That means 25% of the numbers begin with a one. Since this lies between $[25\%, 35\%]$, the dataset passes. In the second case, two of three numbers begin with a leading 1 digit. This corresponds to a 66.67% one leading numbers, which is outside of the valid range and so the second dataset fails.